

Messerschmidt Safety Consultants

Summary and Analytical Report

for

Sue Polk, et al v. Mauricio Peraza, et al

Date of Loss: January 3, 2018

Crash Site: MS 26 E at I-59 N off ramp
Poplarville, MS

Report Prepared for:

Mr. L. Clark Hicks, Jr.

Hicks Law Firm PLLC

211 South 29th Avenue, Suite 201

Hattiesburg, Mississippi 39401

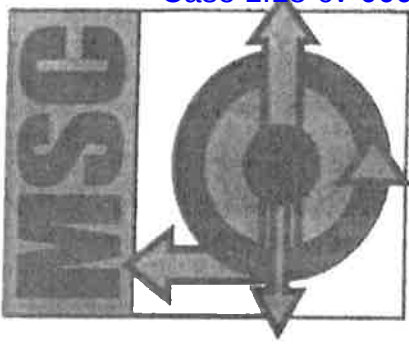
Date Prepared: June 14, 2018

Prepared by: Benjamin N. Smith

Qualifications

I have 14 years of experience in the field of crash reconstruction. During my time as a reconstruction I have completed 18 specialized courses in the field of crash reconstruction with various law enforcement agencies and institutions including The George Washington University, Tulsa University, The University of North Florida, and The University of West Virginia. Additionally, I have been a featured lecturer with the CSI world conference, the Midwestern Association of Traffic Investigators, The International Association for Identification, The University of Southern Mississippi and the United States Army. In the field of electronic event data I have completed five courses in the field of electronic event data and have co-authored five peer reviewed peer reviewed articles. I hold a Bachelor of Science degree from The University of Southern Mississippi's department of science and technology and am currently earning my Master of Science degree in data analytics from Villanova University.





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Dear Mr. Hicks,

Per your request I have performed and/or reviewed the following sources of information in an attempt to analyze the incident captioned above:

1. State of Mississippi Uniform Crash Report no. 5502-PD18000024
2. Photos from Insurance Adjuster C.J. Hester
3. At-Scene Photos from Poplarville PD
4. Inspection of the Polk Yukon
5. Download of the Polk Yukon's ACM
6. Inspection of the MNE Freight Tractor
7. Download of MNE Freight's ECM
8. Download of MNE Freight's GPS Module
9. Crash site inspection
10. Toxicology Reports of Jerry Polk
11. Witness Statement of Cazz Holden

The following report will detail my conclusions and findings in this matter:

Crash Description

- On January 3, 2018 at 10:15 pm Officer Kristy Boyd was dispatched to a two-vehicle wreck on MS 26 and I-59.
- Vehicle 1 was a 2010 Freightliner tractor driven by Mauricio Peraza.
- Vehicle 2 was a 2004 GMC Yukon driven by Jerry Polk.
- Vehicle 1 was exiting off of I-59 at MS 26 and was making a left turn onto MS 26 to head west.
- Vehicle 2 was traveling west on MS 26.
- As vehicle 1 made its turn onto MS 26, vehicle 2's front right collided with vehicle 1's right side fuel tanks.
- Vehicle 1 came to rest in the eastbound lane of MS 26 facing west.
- Vehicle 2 went off the roadway to the right and came to rest on the north side of MS 26 facing west, where it caught fire.

Analysis and Findings

1. Generally speaking, the information regarding the crash position and orientation from the crash report appears to be accurate.
2. The CDR module data recovery efforts (discussed at length in this report) yielded a report containing a deployment (figure 1) and non-deployment event (figure 2). These events do appear to be linked as we see identical parameter readings with a slight offset.

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	89	2624	15
-4	88	2560	23
-3	88	2560	0
-2	71	2176	0
-1	50	960	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	ON
-1	ON

Figure 1

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	88	2560	0
-4	71	2176	0
-3	50	960	0
-2	0	0	0
-1	0	0	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	ON
-3	ON
-2	OFF
-1	OFF

Figure 2

- These data (figures 1 & 2) clearly indicate that Polk was traveling in excess of the posted speed limit in this area (45 mph). The data in figure 1 details Polk's behavior five seconds before impact with the tractor. Polk was traveling at 89 miles per hour 5 seconds before, 88 mph three to four seconds before, and 71 mph two seconds before.

4. Based on the documentation of the crash site, the measurement log and at-scene photos provided with the crash report, and the damage to each vehicle, we have established an approximate impact orientation with respect to the roadway (figure 3). The Yukon's final rest position is not pictured.

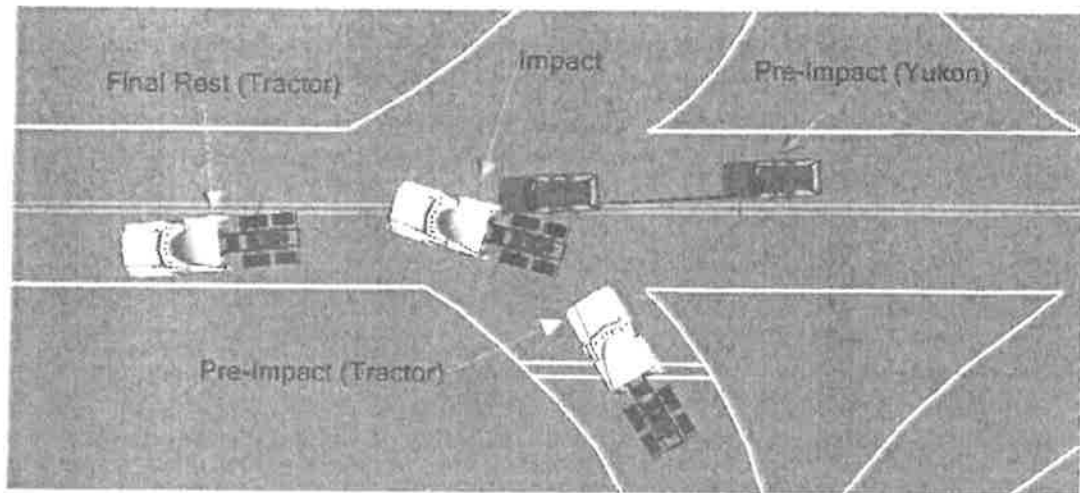


Figure 3

5. The impact orientation indicates that Peraza would have traveled a minimum of 32 feet from his pre-impact position to the area of impact. Based on an acceleration factor (f) of 0.06, this maneuver would have taken approximately 5.7 seconds.
6. The CDR data referred to in figure 1, indicates that the Yukon would have been approximately 464 feet away five seconds prior to impact (figure 4). If we assume that Polk was traveling at approximately the same speed (88-89 mph or 129 feet per second) one to two seconds prior to the outer limit of the data, we see that 6.7 seconds prior to impact (when Peraza was making the decision to pull out one second prior to his physical movement), Polk would have been approximately 684 feet from impact. At this distance, had Polk not been traveling at what was effectively twice the speed limit (45 mph), the time gap relative to Peraza would have been approximately 10.3 seconds. Put simply, a driver entering the roadway would assume that they had about a 10 to 10.5 second gap to Polk (assuming Polk was traveling at or near the posted speed limit). Research application in this case indicates that, with this gap, 98% of drivers would have behaved exactly as Peraza did when he initiated his left turn. Figure 5 is a graphical export that illustrates the statistical breakdown for studied drivers in similar situations to Peraza.

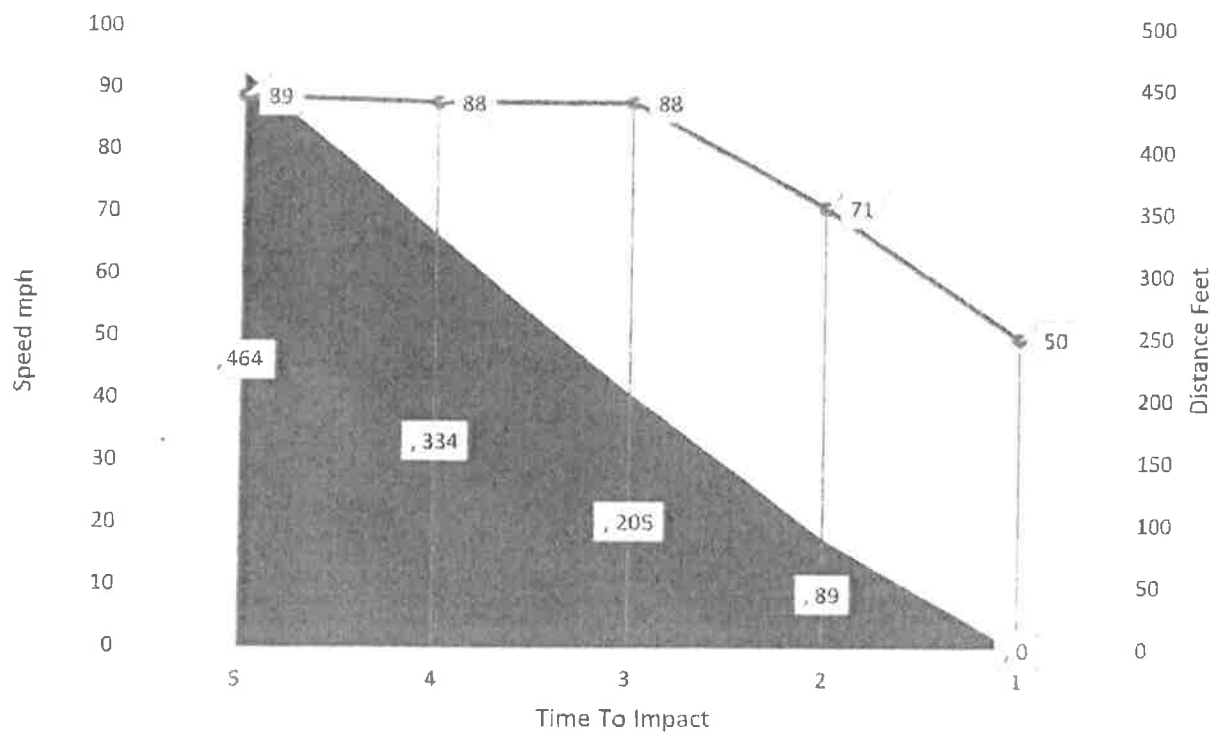


Figure 4 – Graphical breakdown from CDR Deployment data (figure 1)

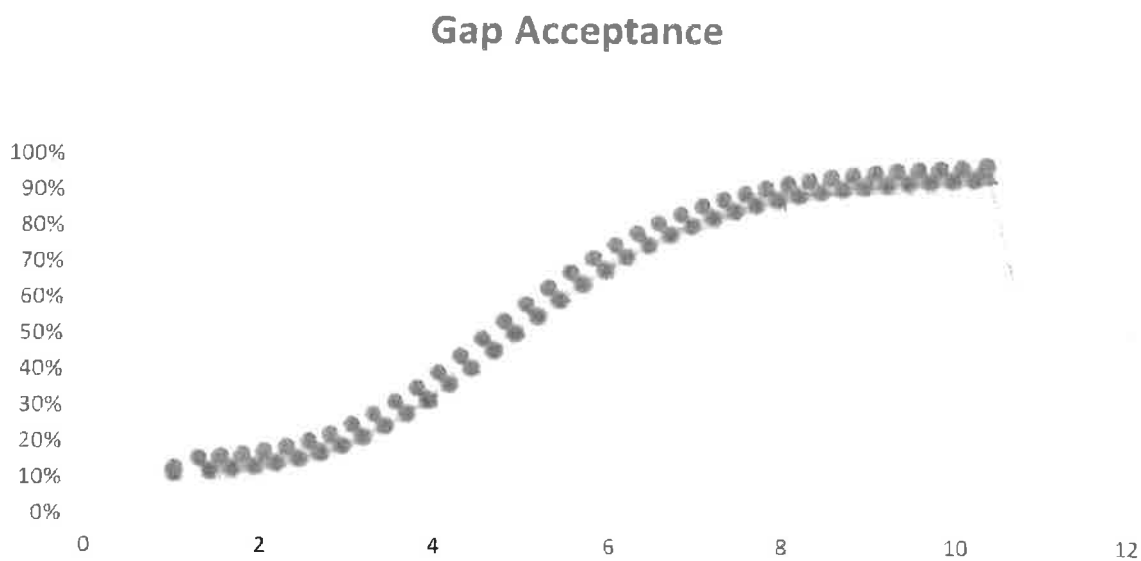


Figure 5

7. As we established in finding 5 above, Polk would have had approximately 5.7 seconds to perceive and respond. 5.7 seconds away (0.7 seconds beyond time 5 (figure 4)) prior to impact he would have been 554 feet from impact. Traveling at or near the speed limit, he would have easily been able to stop or slow before striking Peraza's tractor. Basic total stopping distance calculations reveal that could have braked with a frictional coefficient of $f = 0.35$ (half of peak emergency braking) with a perception response time up to 5.5 seconds (normal being 1.5 to 2.5 seconds) and still avoided the collision with Peraza's tractor.
8. The toxicology reporting indicates that Polk was under the influence of alcohol, cannabis, and tramadol. It is obvious and a well-documented fact that these substances can have deleterious effects of an individual's general decision making and ability to operate a motor vehicle. It is my recommendation that you consult with a toxicologist so that these effects related to this specific case can be analyzed in a more quantitative manner.

Summary of Findings

- Polk's condition and driving behavior, in my opinion, was the cause of this incident. He was traveling nearly twice the posted speed limit, at night, while under the influence of multiple substances.
- Peraza's decision to pull out was completely reasonable based on everything we know about Polk's speed and positioning. Based on Polk's likely distance to impact when this sequence began, Peraza would have reasonably perceived that he had about 10 seconds to pull out. As we discussed earlier, the published research on gap acceptance indicates 98% of drivers would have acted exactly as Peraza did.
- If Polk had been operating his vehicle in a responsible manner, this collision would not have happened. He had more than enough time and space to modulate his speed in a safe and reasonable manner at or near the speed limit.

The findings in this report are based on the data and evidence specifically referenced, as well as the knowledge, skills, education, and training of the author. They were reached to a reasonable degree of scientific certainty using generally accepted principles and techniques in the field of accident reconstruction. I reserve the right to amend my opinions should any new evidence be brought forward. If you have any questions regarding this report, please don't hesitate to contact me.

Sincerely,



Benjamin N. Smith